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ABSTRACT

This booklet, one of a series developed by the Frederick County Board of Education, Frederick, Maryland, provides an instruction module for an individualized or flexible approach to 7th, 8th, and 9th grade science teaching. Subjects and activities in this series of booklets are designed to supplement a basic curriculum or to form a total curriculum, and relate to practical process oriented science instruction rather than theory or module building. Included in each booklet is a student section with an introduction, performance objectives, and science activities which can be performed individually or as a class, and a teacher section containing notes on the science activities, resource lists, and references. This booklet introduces students to an investigation of snakes. The estimated time for completing the activities in this module is 2-3 weeks. (SL)

AIDS TO INDIVIDUALIZE THE TEACHING OF SCIENCE

MINI-COURSE UNITS

BOARD OF EDUCATION OF FREDERICK COUNTY

1973

Frederick County Board of Education

Mini Courses for

Life, Earth, and Physical Sciences

Grades 7, 8, and 9

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1973

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FOREWORD

The contents represented in these modules of instruction, called mini courses, is an indication of our sincere desire to provide a more individualized and flexible approach to the teaching of science.

Data was accumulated during the school year relative to topics in life, earth, and physical science that were felt to be of greatest benefit to students. The final selection of topics for the development of these courses during the workshop was made from this information.

It is my hope that these short courses will be a vital aid in providing a more interesting and relevant science program for all middle and junior high school students.

Dr. Alfred Thackston, Jr.
Assistant Superintendent for Instruction

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CREEPY CRITTERS (SNAKES)

Prepared by

Terrence Best

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Estimated Teaching Time

2-3 weeks

CREEPY CRITTERS (SNAKES)

INTRODUCTION:

No animals are more misunderstood or harmed more by man than snakes. There are so many myths and legends about them that lead you to believe they are slimy, sneaky creatures which are evil all the way. Some people begin screaming just at the sight of a little snake. There are probably good reasons why this list of falsehoods exists today. After all, some snakes are poisonous and it is sometimes difficult to tell them from non-poisonous snakes. In earlier times, before good treatments for snake bite were possible, it was probably important to teach children to fear snakes. If you did get bitten in those days, it was most probably fatal.

This packet will help you to learn that reptiles are very important members of the natural community. They have their place in nature and they should be protected in their natural environment. Especially when they are not harming you, but helping you.

They eat large numbers of rodents and insects. Both of these types of animals can carry many kinds of human diseases. Among the best rodent hunters are the poisonous copperhead and rattlesnake.

OBJECTIVES:

The student can:

1. name and describe 10 snakes found in the local area.
2. list 7 ways in which reptiles are different from man.
3. describe the meaning of "cold blooded".
4. describe the terms nocturnal, diurnal.
5. distinguish between the 3 ways in which snakes kill their prey.
6. name the 4 kinds of poisonous snakes in the U.S., and describe the appearance of the 2 found in Frederick County.
7. describe the 5 ways in which poisonous snakes' bodies are different from non-poisonous snakes.
8. describe how to treat a snake bite.

ACTIVITIES:

1. Read the following information.

Snakes are reptiles. Reptiles represent one of the oldest surviving groups of animals today. They were the first animals with backbones that were adapted to living all their life on land.

There are 4 main kinds of reptiles found in the United States. They are snakes, turtles, lizards and alligators.

Since reptiles are vertebrates (animals with backbones), they are in many ways like man. However, they are also quite different.

a) The skin is dry and scaly. Contrary to many beliefs, reptiles do not have slimy skins.

b) Reptiles are cold-blooded animals. This means their body temperature does not stay at one temperature. It changes with the temperature of the environment. It usually stays 1° C. above the temperature of the environment. In northern climates they must hibernate for the winter; if they don't, they will freeze to death.

c) Most reptiles lay eggs. The eggs have a leathery covering around them and not a hard shell like a bird. They lay their eggs on land, usually burying them in sand or leaves. Since the parents do not hatch the young, it is necessary for the sun to heat the soil so the eggs can hatch.

d) Reptiles generally have well developed tails.

e) Most reptiles have simple pointed teeth. Poisonous snakes have large hollow teeth called fangs. Turtles do not have teeth. Their mouths are more like sharp bone covered with skin.

f) Some reptiles have legs which are poorly developed or missing, such as snakes and some lizards.

g) Some kinds of snakes and lizards have poisonous venom which they place in their prey by biting.

General Description of Snakes

Snakes are the most streamlined of all vertebrates. They do not have legs and their tail is long and well-developed. They do not have eyelids, vocal cords, or a urinary bladder to store urine. Snakes can smell with their tongue. They are also quite sensitive to vibrations. Snakes do not have ears so they cannot hear, but the chances are that they will feel you walking or smell you, before you ever see them.

Locomotion

Snakes can travel very fast without legs on the ground, in trees or by swimming in water. They do this by pulling their body along on the large scales of their belly. Also, the twisting movement of their body helps to pull them forward.

Feeding Habits and Food

Most snakes are very secretive. They are predators and mostly hunt rats, mice, other small rodents, birds, insects, and other snakes. They hunt by night (nocturnal) or day (diurnal) depending on the place where they live. Because they are cold blooded, they really cannot stand to get too hot, for this will kill them. So, in desert country they will be nocturnal but around here they are mostly diurnal.

Snakes generally kill their prey in three ways. Some, like kingsnakes, crush and suffocate their prey by coiling around it. Some just grab their prey and swallow it, like garter snakes. A few inject poison into their prey with a bite. Since their lower jaw is connected by elastic ligaments they can swallow objects much larger than their heads.

Water snakes generally eat frogs, salamanders, fish, and crayfish. Garter snakes prefer frogs, toads, salamanders, fish, tadpoles and earthworms. The hognose snake, common to this area, mainly eats toads. Black racers eat rodents, small birds, snakes, frogs, and insects. Pine snakes mainly eat rodents and other small mammals and birds. Kingsnakes and milk snakes eat other snakes, as well as rodents, small birds and their eggs, and turtle eggs. Copperheads and rattlesnakes eat small mammals and birds.

Shedding of Skin

Instead of eyelids, snakes have a transparent scale over their eyes. These scales and all the skin is shed at certain times of the year. The number of times a snake sheds its' skin a year depends on the climate of the area and the age of the snake.

Young

Most snakes lay eggs and when the babies hatch, they are alone and must feed and protect themselves. However, some hold the eggs inside their body, and hatch the eggs there. Then, the babies are born alive, but they still must care for themselves.

Poisonous Snakes

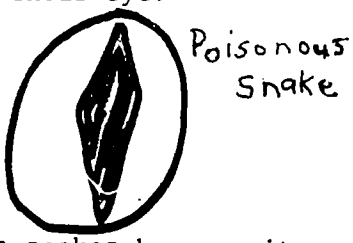
In the United States there are four main kinds of poisonous snakes. They are copperheads, water moccasins, rattlesnakes and coral snakes. Coral snakes are relatives of cobras. Their venom mostly attacks the nervous system of its' prey, causing the heart and breathing to be paralyzed and death follows.

Copperheads, rattlesnakes, and water moccasins are very closely related and are called pit vipers. The venom of pit vipers attacks the circulatory system of its prey, causing internal bleeding and destruction of red blood cells. Their bite will also cause death.

In Frederick County, Maryland, we have two kinds of poisonous snakes. These are the eastern timber rattlesnake and the copperhead. Around here rattlesnakes are generally found high up in the mountains, in cooler places. However, copperheads can be found about anywhere in Frederick County. They seem to like rocky, sunny places best.

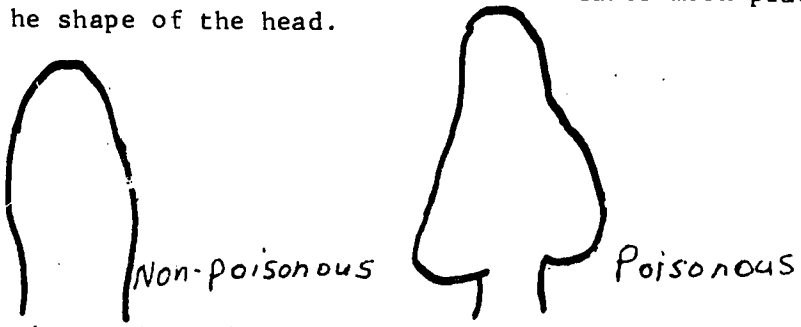
There are five main ways to tell copperheads or rattlesnakes from non-poisonous snakes:

a) Poisonous snakes around here have a cats' eye pupil or a long slit pupil in the eye which goes up and down in the eye. Non-poisonous snakes have a round pupil in their eye.

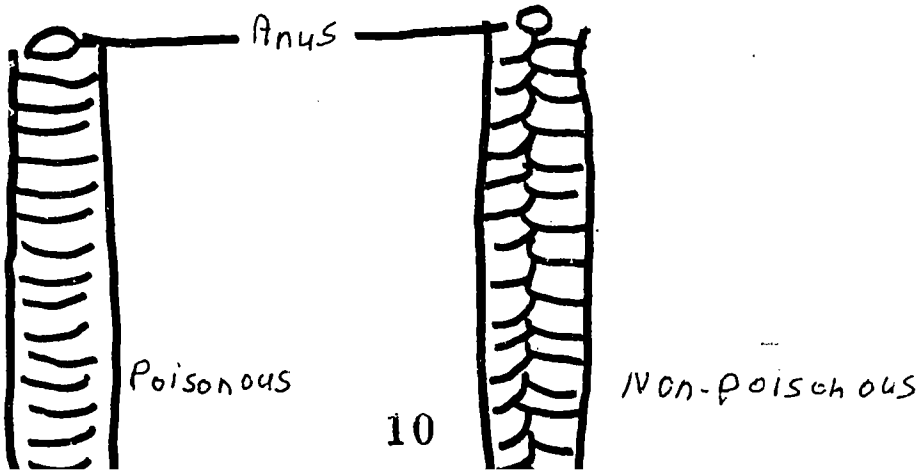


b) Poisonous snakes have a pit or hole located on the side of the head, between eye and the nostril. This pit is larger than the nostril. It is a heat sensing organ, which helps the snake find its warm-blooded prey. Non-poisonous snakes do not have this pit.

c) Poisonous snakes have a triangular sloped head. This is due to the location of the poison glands which are inside the snakes cheeks at the back of his mouth. This is not a reliable characteristic and it takes much practice to tell snakes apart by he shape of the head.



d) On the belly side (ventral side) of a poisonous snake, the scales are single and solid from the anus to the tip of the tail. However, a non-poisonous snake has split scales or double scales from the anus to the tip of the tail.



e) Poisonous snakes have fangs or long hollow teeth located in the front of the snakes mouth. These fangs hinge down and stick out when the snake strikes.

When a copperhead or rattlesnake injects its poison in its prey, it does it by striking. This means that the snake coils up, throws the front part of its body forward, and sticks its fangs into its prey. Then it pulls back, and it is ready to strike again. They do this very fast. Because they strike rather than chew, and because they are so fast you should never tease them or handle them unless you are experienced.

Coloration

Snakes are quite variable in color. Two snakes of the same species will often look different enough that you might think they are different kinds of snakes. The yellow-color phase of the timber rattlesnake does not look like the black color phase. Also, the young do not always look like adults. Young black snakes are gray with some black on them. But they don't look like adult black snakes.

Note:

Remember, snakes are really man's friend. They are an important part of the natural environment. Non-poisonous snakes should not be killed and even poisonous snakes should be left alone, especially if they are found in an area away from man.

For the following activities, you should not use or handle poisonous snakes unless you have experience in doing this.

2. By using a Field Guide, list some species of snakes found in your area and the kind of food they eat. Some suggested field guides are:

Roger Conant, A Field Guide to Reptiles and Amphibians, Boston, Houghton Mifflin Co.

Herbert A. Zim and Hobart M. Smith, Reptiles and Amphibians, New York, Golden Press.

Doris M. Cochran and Coleman J. Goin, The New Field Book of Reptiles and Amphibians, New York, G. P. Putnam's Sons.

3. With the use of one of the above field guides,look up the copperhead and eastern timber rattlesnake. Write a description of their color and markings. Be careful, the rattlesnake has two color phases.

4. With the use of a Field Guide, list ten snakes found in your area and describe their color and markings.

5. Study about some of the different kinds of snakes found in the world. For help, view the following filmstrips and make notes to study from:

Discovering Reptiles	EBF
Snakes	EBF

Movies:

Poisonous Snakes of Maryland

6. With the use of a field guide book, go on a hike looking for snakes. Identify the snakes you find and describe their habitat. Field guides are suggested in activity 2.

7. Research how to treat a snake bite. Write a report on the treatment, and the equipment used in a snake bite kit. Use the encyclopedias in the school library.

8. Find a snake bite kit. By using a piece of rubber or styrofoam, practice using the kit. Demonstrate this to your teacher or the class.

Projects:

9. Make some field observations of snakes. Write down as much information about your observations as you can. Some suggested items to observe are time of day, habitat, date, size or age, is it aggressive or retreating, its movement, food.

10. Begin a life list. Take a spiral notebook and make 3 columns on each page. Make one column for name of snake, one column for date and one for notes. Each time you see a different snake which you have not seen before, record its name, the date, and where you saw it. See how long it takes to see 20 different snakes.

11. Make some capturing equipment. Make a snake stick and a capturing box. Many books have plans, but you can find plans for sure in:

William Hillcourt, The New Field Book of Nature Activities and Hobbies. New York, G. P. Putnam's Sons.

12. Build a snake cage. See your teacher to find out if you can keep a snake in it in class. See the book named in Activity 8 for plans.

13. Care for a snake in class study about it and make the cage look like its natural habitat. Then feed it according to its natural diet.

14. Try photographing some non-poisonous snakes. For lots of good tips on how to do this see the book listed in Activity 8.

EVALUATION:

Your teacher will probably want to see if you have learned the objectives. If you have, then report to your teacher.

It is suggested that you assign certain activities for the students to perform. Or you can tell the students which activities match certain objectives and allow the students to choose their own activities.

Resources:

Field Guides :

Roger Conant, A Field Guide to Reptile and Amphibians. Boston, Houghton Mifflin Co.

Herbert S. Zim and Hobart M. Smith, Reptiles and Amphibians. New York, Golden Press.

Doris M. Cochran and Coleman J. Goin. The New Field Book of Reptiles and Amphibians. New York, G. P. Putnam's Sons

Filmstrips: (New in the IMC)

Discovering Reptiles	EBF
Snakes	EBF

Film Loops: (New in the IMC)

Introducing Reptiles

Models: (New in the IMC)

Vertebrates (Reptiles and Amphibians) Chart

Sound Filmstrips: (New in the IMC)

Fascinating Snakes of North America

Study Prints: (New in the IMC)

Reptiles and Amphibians

Transparencies: (New in the IMC)

Amphibians and Reptiles Milliken Publishing Co.

Movies: (IMC)

Poisonous Snakes of Maryland

Evaluation Form for Teachers

1. Name of the mini course _____

2. Was this unit appropriate to the level of your students?

3. Explain how this mini course was used with your students. (Individual, small group, or total class)

4. Identify the plus factors for this course.

5. List the changes that you would recommend for improvement.

7. Did you use any other valuable resources in teaching this unit? If so, please list.

PLEASE RETURN TO SCIENCE SUPERVISOR'S OFFICE AS SOON AS YOU COMPLETE THE COURSE.

ADDITIONAL SCIENCE MINI-COURSES

LIFE SCIENCE	Prepared by
A Study for the Birds	Terrence Best
Creepy Critters (Snakes)	Terrence Best
How's Your Plumbing?	Paul Cook
Guess Who's Been Here for Dinner	Paul Cook
Plants - The "Other" Living Things	Sharon Sheffield
Let's Look at You - The Human Organism	Sharon Sheffield
Classification: Why is There a Need?	Melvin Whitfield
Protist: The "Unseen" Kingdom	Melvin Whitfield

EARTH SCIENCE	
Coastline Development	Nelson Ford
Ocean Currents	John Fradiska
Features of the Ocean Floor (Ocean Floor Topography)	John Fradiska
Space and Its Problems	John Geist
Invertebrate Fossils: Clues to the Distant Past	John Geist
An Attempt towards Independent Study in Astronomy	John Geist

PHYSICAL SCIENCE	
Household Chemistry	Ross Foltz
Notions on Motions	Kenneth Howard
Environmental Chemistry	Fred Meyers